

We claim:

1. An electrically addressable device for recording, addressing and reading of data, comprising:

a storage array unit having multiple layers of data storage medium,

5 each of said layers being mounted on a substrate; and

an electrical marking device associated with said at least one of the layers of storage medium of the storage array unit to provide a display indicating pre-selected information.

2. The electrically addressable device as recited in claim 1, wherein  
10 the electrical marking device comprises at least one display layer of the layers of data storage medium, said display layer being partially visually alterable to provide said display.

3. The electrically addressable device as recited in claim 2, wherein the display layer further comprises a plurality of multiple-state information  
15 storage cells each representing the value of at least one data bit, wherein the visual appearance of each information storage cell varies depending on the state of the information storage cell.

4. The electrically addressable device as recited in claim 1, wherein the information storage cells each further comprises a multiple state electrical  
20 device which changes states depending on the value of the data bit and having variable visual appearance depending on the state of the electrical device.

5. The electrically addressable device as recited in claim 4, wherein the electrical device includes an electrical fuse that has a modulated visual appearance, depending on whether the fuse has gone to an open circuit.

6. The electrically addressable device as recited in claim 5, wherein  
25 the electrical fuse includes a visual marker that is activated to change the visual appearance of the electrical fuse when the fuse is blown.

7. The electrically addressable device as recited in claim 2, wherein the display layer comprises one of the outermost layers of the storage array unit.

8. The electrically addressable device as recited in claim 7, wherein  
30 the substrate for the display layer is substantially opaque.

9. The electrically addressable device as recited in claim 7, and further comprising a reflective layer between the display layer and the next layer in the storage array unit.

10. The electrically addressable device as recited in claim 3, wherein  
5 the visual appearance of each information storage cell is changed by varying the opacity of the information storage cell.

11. The electrically addressable device as recited in claim 3, wherein the visual appearance of each information storage cell is changed by varying the reflectivity of the information storage cell.

10 12. The electrically addressable device as recited in claim 3, wherein the visual appearance of each information storage cell is changed by varying the color of the information storage cell.

13. The electrically addressable device as recited in claim 1, wherein the pre-selected information indicates the nature of the content of the data stored  
15 on the storage array unit.

14. The electrically addressable device as recited in claim 1, wherein the substrates on which each of the layers of the storage array device is mounted are substantially transparent, and wherein the electrical marking device comprises an addressing device for storing the data on the storage array unit sequentially  
20 across each layer of the storage array unit.

15. The electrically addressable device as recited in claim 14, wherein the storage array device has corresponding data addresses at approximately the same location on each layer of the storage array unit and wherein the addressing device simultaneously stores data on multiple layers of the storage array unit at  
25 approximately the same location on each layer.

16. The electrically addressable device as recited in claim 15, and further comprising a reflective layer on at least one of the outermost layers of the storage array unit.

17. The electrically addressable device as recited in claim 16, and  
30 further comprising a first reflector disposed above a plurality of pre-selected layers of data storage medium and a second reflector disposed below the pre-selected layers of data storage medium.

18. An electrically addressable device for recording, addressing and reading of data, comprising:

a storage array unit having multiple layers of data storage medium, each layer comprising a plurality of bi-state electrical devices arranged in  
 5 orthogonal matrix and a plurality of conductors provided in a substantially orthogonal relationship on each layer;

a plurality of substrates on which the layers are disposed; and

an electrical marking device on at least one of the layers of storage medium of the storage array unit comprising a plurality of the bi-state electrical  
 10 devices disposed to provide a display indicating pre-selected information, depending on the state of each of the electrical devices.

19. The electrically addressable device as recited in claim 18, wherein each of the electrical bi-state devices comprises a write-once device.

20. The electrically addressable device as recited in claim 18, wherein  
 15 the display indicates information about the nature of the content of the data stored on the storage array unit.

21. The electrically addressable device as recited in claim 21 wherein the display indicates information about the subject matter and name of the content of the data.

20 22. The electrically addressable device as recited in claim 18, wherein the display indicates the amount of the storage array unit that has been recorded with data.

23. The electrically addressable device as recited in claim 18, wherein each of the electrical bi-state devices comprises a fuse device.

24. A method for marking the content of an electrically addressable device used for recording, addressing and reading of data and having a storage array unit with multiple layers of data storage medium, each mounted on a substrate, comprising:

selecting at least one outermost layer of data storage medium as a  
 30 display layer; and

electrically storing data on the outermost layer to provide a display indicating pre-selected information.

25. The method of marking as recited in claim 24, and further comprising disposing a reflective coating at the interface of the display layer and the remaining layers of the storage array unit.

26. The method of marking as recited in claim 24, wherein the display  
5 indicates information about the content of the data.

27. The method of marking as recited in claim 24, wherein the display indicates the amount of the storage array unit that has been recorded with data.